

## NEWS LETTER

PLANT QUARANTINE AND CONTROL ADMINISTRATION

UNITED STATES DEPARTMENT OF AGRICULTURE

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TECHNOLOGICAL

During the spring of this year an infestation of the Mexican fruit worm, Anastrepha ludens, occurred in the Lower Rio Grande Valley of Texas and it became necessary to sterilize fruit from this district if it was to be shipped to those localities in the United States where the climate and conditions were such that the insect was liable to survive and become a dangerous pest. The extent of the infestation has been discussed by P. A. Hoidale in an earlier issue of the News Letter. He mentioned that the requirement that certain fruit be sterilized if shipped to various points in the United States went into effect on March 5.

Because of the lateness of the season and the condition of the fruit, which was not of the best, and the fact that none of the shippers were equipped to sterilize by heat, the method of cold sterilization applied to Florida fruit in the Mediterranean fruit fly campaign in the spring of 1930 was recommended. The requirement for sterilization by this method is that the fruit be cooled down to a temperature between 30° and 31° F. at the approximate center of the fruit, and held at that temperature for a period of 15 days after the fruit reaches a temperature of 31°. This allows a variation in temperature within one degree and can be applied in any well equipped commercial cold storage plant. There was some hesitancy among the shippers in adopting this method of sterilization for two reasons:

(1) In previous years, some of the fruit from this valley had been placed in cold storage at 38° to 42° F. and, in some cases, considerable losses had been sustained due to the fact that the temperature was too high for the long storage of this fruit and they had attempted to hold the fruit too long.

(2) The price of grapefruit on March 5 was about  $\frac{1}{2}$  to  $\frac{1}{4}$  cents per pound for orchard run fruit and it was considered that an additional charge of 10 to 20 cents per box, which is about the usual price paid for cold sterilization of fruit, would eliminate any possible marketing profit from handling the fruit.

Storages were approved for sterilization in a number of the larger

cities of Texas and in Chicago and St. Louis, and the fruit began moving out for sterilization on March 5. The fruit was sterilized at 11 storages in 7 cities--Harlingen, San Antonio, Houston, Fort Worth, and Dallas, Tex., and Chicago and St. Louis. Approximately 214 carloads of fruit in all were sterilized, 17 in St. Louis, 15 in Chicago, and the rest in Texas cities. The last car for sterilization moved out on March 25. The first lot of fruit completed sterilization on March 24 and the last lot on April 28.

The condition of the fruit after sterilization was good. There was practically no pitting and little decay. The shippers and produce dealers expressed themselves as being well satisfied with the results obtained in holding the fruit. Due to the fact that there was little fruit on the market in Texas when the sterilized fruit began to move out, a very good price was obtained. In some cases the price was \$2 a box more than could have been obtained when the fruit was harvested.

In the supervision of the sterilization it was necessary to check the fruit into the cold storage plant, to take temperatures of the fruit as it cooled down, determine the time that the fruit reached the required temperature, see that the fruit was held at the correct temperature, and certify it out when sterilization was completed. The work at Chicago and St. Louis was handled by the transit inspectors of the Division of Domestic Quarantines; at San Antonio and Houston, by inspectors of the Pink Bollworm Project; at Fort Worth and Dallas, by a man from the Technological Division, assisted by an inspector of the Texas State Department of Agriculture, together with some temporary help; and at Harlingen, by two inspectors from the Mexican Fruit Worm Project. The general supervision of the sterilization was carried on by the Technological Division. The hearty cooperation of the men from all these organizations made possible the successful completion of this work.

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## FOREIGN PLANT QUARANTINES

### RECENT ENTOMOLOGICAL INTERCEPTIONS OF INTEREST

Mediterranean fruit fly via Canada.--Six living larvae of the Mediterranean fruit fly (Ceratitidis capitata Wied.) were intercepted at Buffalo, N. Y., in a sour orange in cargo from Spain via Hamilton, Ontario, Canada.

Mediterranean fruit fly in carambola.--The Mediterranean fruit fly was intercepted at San Pedro, Calif., in carambola (Averrhoa carambola) fruit in baggage from Hawaii. This is the first record in our interception files of this fruit fly being taken in carambola.

Termite from British Honduras.--Workers of Coptotermes sp. (termite) were intercepted at Mobile, Ala., in a pine log in cargo from British Honduras. T. E. Snyder, of the Bureau of Entomology, states that this is one of the worst pests of timber in the world and is not found in continental United

States.

Thrips on chrysanthemum.--Frankliniella insularis (Franklin) (thrips) was intercepted at New Orleans on a flower of chrysanthemum in quarters from Cuba. J. R. Watson, of Gainesville, Fla., states that this is the common flower thrips of the West Indies and southern Florida.

Melandryid from Panama.--Ischyomius chevrolati Chmp. (Melandryidae) was intercepted at San Francisco on bananas in cargo from Panama. This represents the first interception record of this beetle in our files.

West Indian sweetpotato weevil from Mexico.--A larva of the West Indian sweetpotato weevil (Euscepes batatae Waterh.) was intercepted at Brownsville, Tex., in a sweetpotato in baggage from Mexico. This is the first definite record of this weevil being intercepted in sweetpotato from Mexico by inspectors of the Plant Quarantine and Control Administration.

Cucujid from India.--Silvanus unidentatus Fabr. (Cucujidae) was intercepted at Washington, D. C., in moss used as packing around pear cuttings in the mail from India. This cucujid has been intercepted previously with narcissus bulbs from France and tulip bulbs from the Netherlands.

Erotylids new to National Museum.--Adults of Coccimorphus frenatus var. and Ischyrys auriculatus Lac. (Erotylidae) were intercepted at San Francisco on bananas in cargo from Panama. W. S. Fisher, of the Bureau of Entomology, reports these to be new to the National Museum collection.

Gelechiid from Mexico.--Gnorimoschema lycopersicella (Busck) (Gelechiidae) was intercepted at Nogales, Ariz., in a tomato in cargo from Culiacan, Sinaloa, Mexico. This leaf miner was described in 1928 and is reported from the Bahamas, Bermuda, Cuba, Mexico, Hawaii, California, and Pennsylvania.

Bean pod borer in Porto Rico.--Specimens of the bean pod borer (Maruca testulalis Geyer) were collected in Porto Rico in Lima bean pods. The infested Lima beans were for export to the mainland of the United States.

Azalea leaf miner from Japan.--A larva of the azalea leaf miner (Gracilaria azaleella Brants) was intercepted at Washington, D. C., in an azalea leaf in the express from Japan. This introduced species is reported from Florida, Maryland, New Jersey, Pennsylvania, New York, and the District of Columbia in this country.

Weevil from Hawaii.--Rhyncolus longulus Boheman (Curculionidae) was intercepted at San Francisco with bananas in cargo from Hawaii. This weevil is not recorded from the continental United States.

Thrips on Ficus nitida.--Gynaikothrips uzeli (Zimm.) was collected in Porto Rico on the leaves of Jaguey de la India (Ficus nitida). J. R. Watson, of Gainesville, Fla., reports this as a common thrips on many species of Ficus in south Florida and the West Indies.

Bruchid from Trinidad.--Adults of Zabrotes subfasciatus (Boh.) (Bruchi-

dae) were intercepted at Washington, D. C., in Phaseolus seed in the express from Trinidad. While the primary host of this bruchid is the common bean, it also attacks other food legumes. Its range extends from Texas to Brazil.

#### RECENT PATHOLOGICAL INTERCEPTIONS OF INTEREST

Hydrangea mildew.--Oidium sp. has been reported by inspectors of special permit material as occurring on Hydrangeas since 1923 and possibly earlier. The disease was found on Long Island and later at other points on the Atlantic seaboard and in recent years in the Middle West. This spring it was found at Hampton, Va., on special permit material. This disease is not listed in U. S. D. A. Bul. No. 1366, and the Bureau of Plant Industry apparently had no record of its occurrence in this country until specimens were submitted by this organization during the past year or two. Perithecia are necessary to enable the specialists to determine the identity of the fungus and these have not been found as yet.

Honeydew melon rot.--A rot of honeydew melon from Chile intercepted at New York was found to be caused by Fusarium sp. which had invaded the tissue quite deeply. After being kept in the laboratory a few days a mass of spores was produced at the margin of the invaded tissue.

Thielaviopsis on Sagittaria.--Thielaviopsis paradoxa developed on some Sagittaria sagittifolia from China intercepted at Buffalo, when kept in a moist chamber. This fungus has been intercepted on Eleocharis a number of times since it was first noted by this office (see News Letter for March, p. 3).

New nema in bulb from Bolivia.--Nemas in a bulb of Achancara from Bolivia and intercepted at New York have been determined as Cephalobus n. sp. (not yet described), possibly parasitic.

Stellate melanose of grapefruit.--A grapefruit leaf sent in from Porto Rico was found to be affected with stellate melanose, a disease that is more or less common on that host in Porto Rico. The disease is characterized by raised areas, brown in color and with a decided tendency to be star shaped. The cause of the trouble is not known.

Mosaic symptoms on Cymbidium.--Two years ago cymbidiums were found showing mosaic-like symptoms during an inspection of imported orchids growing near New York City. So far as we can learn no mosaic of orchids has been reported in literature. The possible importance of the trouble is not known. The disease is reported from Illinois in addition to California and the New York-New Jersey area in which affected plants were previously found. It is hoped that observations on these plants, by growers, will ultimately enable us to learn the characteristics of the disease.

Orange twig disease.--About half an inch of a tiny orange twig from Spain intercepted at Philadelphia was covered with little grayish-black pustules of what proved to be Mycosphaerella sp. Species of Mycosphaerella have been reported on orange in Brazil and in California but the specimen received was not recognized as either species and was inadequate for study.

Stagonospora on Lachenalia.--A disease of Lachenalia nelsoni leaves collected on special permit material growing at Syosset, L. I., and having the same appearance as the scorch or fire of narcissus, has been determined to be caused by the same organism, Stagonospora curtisii. This is said to be a new host for this disease.

Botrytis sp. interceptions during April.--In connection with the discussion of Botrytis interceptions in the May News Letter, page 5, it is interesting to note that such interceptions were relatively heavy during April, in accordance with past experience. During April, Botrytis sp. was intercepted on onion from Belgium, England (2), Germany, and Norway; on cabbage from England and Germany; on rutabagas from England; on orange from Spain; on carrot from Germany; on gladiolus from England; on bulbous iris from Virginia; on narcissus from Washington (8); on parsnips from England; and on sprouts of potatoes from Germany.

#### FRUIT FLY SURVEY PARTY RETURNS

C. E. Cooley and Max Kisliuk, who have been making a fruit fly survey in the West Indies and South America (News Letter No. 6, June, 1931), returned April 25, after an absence of about twelve months. They report that in nearly every locality visited they met with a cordial reception and friendly assistance from both officials and fruit growers. During the year they visited all the larger West Indies (Antigua, Barbados, Dominica, Guadeloupe, Haiti, Jamaica, Martinique, Nassau, Nevis, St. Croix, St. John, St. Kitts, St. Lucia, St. Thomas, St. Vincent, and Trinidad), later spending considerable time in Brazil, Uruguay, Peru, and Chile. A report on their findings is in course of preparation.

#### CUSTOMS COOPERATION ON THE CANADIAN BORDER

Along the 3,000 miles of Canadian border there are only three points where foreign plant quarantine inspectors are stationed--Buffalo, N. Y., Detroit, Mich., and Blaine, Wash. Apart from these points, which constitute the main channels of trade and traffic between this country and Canada, the small and irregular volume of movement of plants and plant products from Canada scarcely justifies a numerous staff of border plant quarantine inspectors. This situation is somewhat more emphasized by the fact that Canadian-grown plants and plant products are largely admitted without need of inspection at the border.

Under these circumstances it has been arranged that enforcement of plant quarantines along the Canadian border be carried out by the U. S. Customs inspectors, who have throughout cooperated in this matter very efficiently and willingly. This arrangement will be continued, but in order to give all possible help to the customs officials at the 160 or more ports of entry scattered along the border, it is planned to have a representative of the Administration visit each port at intervals to discuss quarantine matters and enforcement procedure with the inspectors personally and assist them in every way in dealing with local plant quarantine problems.

In furtherance of this plan, the border ports will be grouped in three districts. The eastern district will extend from the Atlantic seaboard to

Erie, Pa., and L. M. Scott will cover the ports in this section. A central district will comprise the ports of entry from Erie west to the eastern boundary of Montana, with W. W. Wood of the Detroit office acting as contact agent. The western district, consisting of border ports through the States of Montana, Idaho, and Washington, will be covered by C. E. Cooley, with headquarters at Bellingham, Wash.

As a further step in this cooperative relation with the Customs Bureau force, it has been arranged to place incinerators of the standard type now in use along the Mexican border at six ports of entry along the Canadian border so that intercepted plant materials abandoned by the owners may be safely disposed of.

#### RICE STRAW PACKING CARRIES INSECTS

A. C. Fleury, Chief Quarantine Officer of California and Collaborator of this Administration in foreign plant quarantine enforcement, writes April 30, as follows:

"In connection with the consideration now being given to the question of control or restrictions against plant material as packing with shipments of commodities other than plant products from foreign countries, you will no doubt be interested in the interception recently made at San Francisco. Four interceptions of the rice borer, Chilo simplex, in rice straw packing around earthenware carried as cargo on Japanese freighters have been made in the past few weeks. In every instance evidence of the presence of the insects was abundant and numerous larvae in various stages of development were secured with little difficulty. The shipments in question represented four arrivals totaling sixteen crates."

#### U. S. FLEET COMPLIES WITH QUARANTINE RESTRICTIONS

A report from A. P. Messenger, collaborating Federal plant quarantine inspector at San Pedro, Calif., April 15, states:

"When the Atlantic Squadron of the U. S. Fleet arrived the early part of last month, no contraband material was found. Later, when part of the Atlantic and Pacific Squadrons returned from maneuvers in Hawaii, we again found no contraband material. The officers with whom we came in contact extended courtesies and aided our inspection in all ways possible. We were given a little prompter service in connection with the Pacific Squadron than with the Atlantic, no doubt due to the fact that they were more experienced with our work, as very clearly some of the vessels from the East Coast had never been boarded before."

#### CERTIFICATION OF APPLES FOR EXPORT

Recent changes in the French regulations governing the admission of American apples, and the considerable volume of movement of this fruit for export, have noticeably increased the amount of time necessary for inspection and

certification in the ports of New York and Baltimore. In the latter port the inspection staff has on two occasions been unable to handle the outgoing shipments expeditiously and was forced to call for temporary assistance from the Washington office.

#### NOTES OF GENERAL INTEREST

During the latter half of May, E. R. Sasscer visited the Mexican border to confer with the district leaders of all three districts on the enforcement problems and administrative arrangements in that region, returning along the Gulf by way of New Orleans.

G. G. Becker spent the week of May 9 discussing port inspection problems with the inspectors at Savannah, Charleston, and Norfolk.

W. W. Wood, of the Detroit office, was in Washington in the early part of May, working out with this office and customs officials methods for cooperative relations with customs inspectors along the Canadian border in the matter of plant quarantine enforcement.

Inspection of special permit material will be continued till after July 1, by J. M. R. Adams, who left on May 6 to carry out this work in Ohio, Pennsylvania, New Jersey, and Delaware.

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#### DOMESTIC PLANT QUARANTINES

##### TRANSIT INSPECTION

With the close of the nursery stock shipping season, transit inspection was discontinued early in May at Kansas City, St. Paul, and Omaha, and the force at Chicago, New York, and Boston is also being decreased. Men who were assigned to this seasonal work on transit inspection are returning to the pest-control projects from which they came, such as those relating to the white-pine olister rust and European corn borer.

A list of 85 shipments moving in apparent violation of domestic plant quarantines and intercepted by California State quarantine officials, principally of Los Angeles County, was recently received from A. C. Fleury, Chief Quarantine Officer of that State. These were found during the 13-month period ending with the close of 1931. Restricted articles intercepted in California are either destroyed or returned to the consignor. These shipments contained articles restricted by quarantines relating to the Japanese beetle, narcissus bulb pests, gipsy moth, white-pine blister rust, European corn borer, and satin moth. The State of California makes a practice of inspecting all classes of nursery stock and other plant material arriving in the State whether or not it is accompanied by Federal or State certificates, and is thus able to detect any violations which may enter. The parcel-post shipments intercepted in California and certain other States are those which go through the usual Eastern and midwestern distribution points in closed sacks and are not available

for inspection prior to arriving at the destination State. The reporting of such violations to the Administration is a distinct assistance in the enforcement of Federal plant quarantines.

A considerable number of carboys of sulphuric acid which had been packed in sand and shipped by chemical companies from the Japanese beetle infested areas have recently been reported by inspectors. These shipments have not been turned back but the records are forwarded to the South Norwalk office of the Administration for investigation.

Twenty or more specimens of scale insects and borers used in a recent exhibition by the Illinois State Department of Agriculture in Chicago have been turned over to the transit inspection office in that city and will be retained there for permanent use.

The list of plants and plant products now subject to terminal inspection in Arkansas has been extended to include "Sweetpotato, onion, tomato, and cabbage, and other cruciferous plants, but excluding other herbaceous plants of all kinds, as well as seeds, bulbs, and roots. However, parcels of nursery stock (woody plants) originating within the State, which have an Arkansas permit or certificate attached, should NOT be sent for terminal inspection, nor should parcels of sweetpotato plants, onion, tomato, cabbage, and other cruciferous plants originating outside of the State be sent for terminal inspection if an Arkansas permit is attached, nor should parcels of sweetpotato plants, originating within the State, be sent for terminal inspection, even though no permit or certificate is attached."

A tabular summary of State nursery stock shipping regulations entitled, "General Requirements for Interstate Trade in Nursery Stock," has recently been completed in this office in the form of a wall chart, and distributed to shippers and others interested. Additional copies are available on request. This chart is a revision of Table 1, bearing the same title, formerly published by the Bureau of Plant Industry.

PQCA 335, dated May 16, 1932, entitled "Legal Data with Reference to Agricultural Quarantine Litigation in the Courts of the United States," has recently been issued. It presents a synopsis of decisions of interest to plant quarantine officers. "The information has been compiled in the Office of the Solicitor of the Department of Agriculture and is believed to be complete so far as concerns plant quarantine decisions in the Federal courts. An attempt has also been made to include decisions in State courts but it is possible that some such decisions have been overlooked."

#### WHITE-PINE BLISTER RUST

The inspection of nurseries in New England and New York, whose owners desire to ship white pines to States that are only lightly infected with the white-pine blister rust, is being carried out by Messrs. Sheals and Corliss. A considerable number of applications for such permits have been received from time to time but thus far only three nurseries have been granted authority to make shipments. Two other nurseries in the Northeast and two in the Northwest

have had certain plots tentatively approved for growing white pines. Under the quarantine regulations now in effect, permits are issued to nurseries only when the pines are grown on premises within 1,500 feet of which no currant or gooseberry plants, and within 1 mile of which no European black currant plants, have existed since the time the pine seed was planted. Modifications of these restrictions as suggested at the recent public hearing are now under consideration, and the Administration is in correspondence with the plant quarantine officers of the various States on the subject.

The Idaho State Forest Nursery, adjoining the campus of the University of Idaho, has been tentatively approved for growing white pines. The University made a detailed survey of the area last summer and located 21 plantings of cultivated currants and gooseberries within the 1,500-foot zone. By February, the eradication of these 21 plantings had been accomplished. Black currant eradication was carried out in Moscow several years ago, and the University is canvassing the city again this season for the purpose of locating and destroying any such plants which may have sprouted from old roots.

#### NARCISSUS BULB PESTS

PQCA 332, issued March 22, 1932, gives a record of the 1931 inspections of narcissus plantings in the various States, including the number of bulbs certified as uninfested or certified after treatment.

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#### DATE SCALE

During the month of April inspection in the Coachella Valley was interrupted on several occasions by high winds. At this season of the year such storms are quite prevalent when there are areas of low barometric pressure along the coast and the desert temperatures are rising rapidly. The wind sweeps through the San Geronio Pass and through the Coachella Valley laden with dust and sand. At some points in the Valley where the wind has an uninterrupted sweep over the unirrigated portion of the desert, automobile windshields are badly pitted by the sand carried by the wind.

During these periods inspection from ladders is impossible and ground inspection is done in sheltered places or clean-up work is carried on. Recently a row of seedling palms, planted about 20 years ago, was dug up. The palms were very close together, the tops intermingling and forming a dense thicket. About 3 feet of the trunks were buried by drifting sand. The dense foliage formed a shelter for various species of desert rodents, which were disturbed when the palms were being dug out. One good sized pack-rat sought refuge in the nearest shelter which happened to be the pants leg of one of the inspectors, much to the consternation of both the rat and the inspector. The rat was finally subdued and the inspector received only a few scratches to remember the occasion.

The section-by-section survey locating unlisted palms is being continued

in all sections of the date-growing area both in California and Arizona. Most of the territory covered is receiving its last inspection. Comparatively few palms have been overlooked in previous inspections and only one unlisted palm was found to be infested.

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## EUROPEAN CORN BORER AND JAPANESE BEETLE

### Specialized Corn Borer Activities

Since April 11, intensive inspection work has been carried on by the State of Connecticut for the clean-up of cornstalks and stubble throughout the entire State, in accordance with the State clean-up law which provides that all cornstalks and stubble must be disposed of by plowing, burning, or burying by April 10. Twenty-two men with supervisors are engaged in the work which, it is expected, will be completed by the first week in May.

Lee A. Strong, Chief of the Administration, and L. H. Worthley, in charge of Japanese beetle and European corn borer control work, called at the Springfield, Ohio, station of the western corn borer control area on April 26 for a conference with Erle G. Brewer, who is in charge of the corn borer control work in the western area.

The eradication work in cleaning up the territory adjacent to the isolated infestations which were found last year in Posey Township, Harrison County, Ind.; District #2, in Kenton County, Ky., and Mosel Township, in Sheboygan County, and Centerville Township, in Manitowoc County, Wis., was completed in a very satisfactory manner.

### Exclusive or Combination Japanese Beetle Work

Field trap activities began on April 15 with the placement and baiting of traps in Miami, Fla. Four hundred traps were in operation by April 22. An employee of the trapping division proceeded to Florida early in April for the purpose of making local arrangements for labor and storage facilities. Trap inspectors are being hired through local welfare associations, unemployment committees, and other similar organizations. With establishment of the trap route in Miami, operations were begun in Tampa. Here 400 traps were placed and baited between April 22 and April 30. A locally hired inspector was left in charge of the work after thorough instruction in trap tending. Another employee from the South Norwalk headquarters proceeded to Florida late in April. This latter agent will assist in the establishment of the Florida work and the routes to be set up in Georgia and South Carolina, eventually supervising the work in these three States.

Striking dockmen in New York City delayed for several days the scheduled distribution of traps in Jacksonville, Fla. Cartons of traps at the docks awaiting movement to Florida via boat were held up due to the strike and as a result caused a slight rearrangement of southern trap operations.

For the purpose of securing data on the earliest emergence of the beetle in the latitude of Washington, D. C., 300 traps were on April 28 placed in and around the grounds of the Potomac Garden Club at Benning Road and the Anacostia River. Infestation last year was particularly heavy in this section.

Machinery was set up, a platform and bin constructed, and ingredients and containers assembled for bait mixing. A few test batches were run off, but continuous mixing was not started until May 2.

Annual surveys by scouts in Sussex County, N. J., have over a period of years failed to reveal any infestation of Japanese beetle in this northernmost New Jersey county. This summer it is planned to distribute 1,250 traps in 21 separate communities evenly distributed throughout the county. These will serve as a check to the accuracy of past scouting operations. Sussex County is but 45 miles from the zone of dense, continuous infestation in central and southern Jersey. With an area of 567 square miles, it exceeds in altitude all other counties in the State. In it is situated High Point, 1827 feet above sea level, the highest altitude in New Jersey. There are 77 lakes in the county, many of which are used as summer resorts. High Point Park and Stokes State Forest, containing 10,000 and 11,000 acres, respectively, are also located in the county. The traps will be tended by three men who will be furnished with trucks. Results of the season's trapping operations should furnish some basis for a comparison of the relative efficiency of visual scouting in competition with mechanical traps.

Organization of a border patrol began on April 5 with the opening of a single post in Pennsylvania. Successive establishment of posts continued as rapidly as suitable men could be hired. By the end of the month there were in operation 7 posts in Pennsylvania, 6 in Virginia, 4 on the Maryland-West Virginia State line, and 7 on roads leading from the regulated area in New York.

Not many days elapsed after the establishment of the road patrol on the quarantine border before Japanese beetle grubs were intercepted. A hydrangea plant intercepted on April 16, while being transported from Philadelphia to a point in western Pennsylvania, contained four grubs of this species. Two later interceptions yielded one and two grubs, respectively, in plant material destined to Utica, N. Y., and Cumberland, Md.

Under ordinary circumstances booths placed at road inspection stations afford shelter and protection for inspectors while making their reports and during prolonged lulls in traffic movement. That they cannot always be depended upon was illustrated early in April at the road station on the Richmond Road at Woodbridge, Va. The driver of an automobile had stopped at the station. Due to the heavy rain, the driver of the car following failed to see the stop signs and applied his brakes too late to bring his car to a halt before reaching the station. The car skidded, left the road and crashed into the warning signs and bomb torches spaced along the highway. The inspector, seeing the car out of control, hurriedly dodged into the booth to avoid splintering signs and flying bomb torches. The car continued to skid, however, and finally

collided with the booth, overturning it with the inspector inside. Bruised and shaken by the crash, the inspector was taken to a near-by doctor for first-aid. Fortunately there were no serious injuries and the inspector was able to return to duty. In a verbal report to his district supervisor, the inspector stated he did not wish to experience any more "Virginia cyclones."

The first jail sentence to be meted out for a violation of the Japanese beetle quarantine was imposed upon Samuel Winarsky, a huckster, of 233 Jeliff Avenue, Newark, N. J. This defendant pleaded guilty to three violations of the regulations involving transportation during July, 1931, of truck loads of uncertified farm products from Newark, N. J., to Monticello, N. Y., a point in nonregulated area. On each of the three trips Winarsky was stopped by transit inspectors of the project, informed that he must return for certification, and warned of the possible consequences of disregarding the quarantine. Despite the warnings, he continued with his contraband to Monticello. Shortly after the violations, Winarsky was arrested. He waived a hearing before a United States Commissioner in Newark and was bound over for further court action. A plea of guilty was entered before Judge Guy L. Fake in the United States District Court at Newark on April 29. Counsel for the defendant explained that his client was about to be dispossessed of his home, was out of employment, and was unable to pay a fine of any amount. After due consideration of the case with United States Attorney Phillip Forman, R. W. Sherman, representing the project, and the defendant's counsel, the court sentenced Winarsky to five days in jail. This action it is believed will have a deterrent effect in preventing further quarantine violations on the part of New Jersey produce dealers.

Seeding to smartweed of the balance of the acre leaded plot at White Horse, N. J., to be devoted to a smartweed-lead arsenate-trapping demonstration was accomplished on April 22. Fall-planted smartweed seed had germinated and seedlings were one-fourth to one-half inch high when the spring planting was made. In furtherance of the demonstration, a few hundred potted seedlings will be set out in the leaded soil. Due to poorer soil, trash dumping, and packing of the soil by vehicles and pedestrians, growth was not yet in evidence on the smartweed plots on the six vacant lots in Philadelphia. Leveling of the previously rough land makes the plots desirable as cross-cuts, dumping grounds, and baseball fields. Since daily policing of the plots has been impossible a number of them have been used by boys as ball fields. Signs and stakes have been destroyed. Cooperation of local police has not been sufficient to break up these practices. If necessary, transplantings of seedlings from the many weed patches in Philadelphia will be made to fill in any vacant spots on the demonstration grounds. Bids have been requested for the manufacture of 1,000 Japanese beetle traps with large perforated metal beetle containers. These will be used on the smartweed demonstration plots in Philadelphia. It is anticipated that the daily catches will be so large that the customary pint or quart glass jar container would be inadequate to hold the beetles attracted to the traps.

Cooperation accorded by officials of the Baltimore Flower Show this year permitted a strict division of certified stock intended for return to classified premises from uncertified and possibly infested stock. In the arrangement of exhibits the management of the show so handled the stock in exhibits from classified commercial establishments that it was at all times isolated from other

stock. Exhibits of private garden clubs and individuals were kept at one end of the show room at a considerable distance from certified stock. This year's Baltimore show was held in the Fifth Regiment Armory, from April 4 to 9. Several of the exhibits were checked in on April 1, but the majority of the stock arrived on April 3. About 36 commercial exhibits were from establishments classified under the Japanese beetle regulations. There were checked into the show and certified for return to certified premises 7,829 plants, 1,853 square feet of sod, and 108 bales of peat. Since the show was staged on a polished hardwood floor, each exhibitor was required to place the tar paper beneath his plants or peat moss, and to enclose his exhibit with a 3-inch wooden border. Wide aisles were maintained between exhibits. The show was staged under the auspices of The Florists' Club of Baltimore. John E. Raine, manager, and members of the show committee cooperated in every way with the Baltimore quarantine office in proper handling of certified material.

Many firms and individuals throughout the regulated area who have heretofore never engaged in the nursery business are this year adding evergreens, shrubs, rose bushes, bulbs, and frequently a general line of nursery stock to their sales items. Regular nurserymen are experiencing competition from drug stores, furniture dealers, chain stores, independent grocerymen, paint and hardware stores, roadside markets, curb vendors, and even drygoods and notions stores. Many unemployed men have rented vacant stores and put in a stock of plants, many of which are retailed at "bargain prices." A considerable trade in plant stock has in the past few years been built up by department stores and mail order houses. These outlets added to the regular channels for movement of quarantined articles from the regulated area frequently complicate certification of stock. Retailers who establish their business almost over night are uninformed of quarantine regulations. Their sales of possibly infested stock to persons intending to remove the same to unquarantined sections brings the equally uninformed purchaser in conflict with the regulations. This is particularly the case in communities near the border of the regulated zone.

General Circular No. 4-F, issued February 15, 1932, by the Railway Express Agency, Inc., was during April distributed by the common carrier to all express agents in the United States. This publication contains general instructions, laws, and regulations relating to the transportation of horticultural and nursery stock. Among other quarantines, the circular summarizes the regulations applicable to the Japanese beetle, and in addition lists all designated express offices within the regulated area effective January 1, 1932. This permits express agents to readily determine whether a destination point is within a regulated area and shipments of designated articles may proceed without certification, or whether the consignees are located in unregulated area and the consignments accordingly subject to certification. Regulations imposed under the Japanese beetle quarantine are the only ones treated in this detailed manner.

The 30,400 Japanese beetle posters received late in March were during April distributed to all regular shippers, postmasters, and agents of common carriers throughout the regulated areas. Two thousand five hundred and forty-four posters were forwarded to the traffic division of the Railway Express Agency, Inc. The Agency in turn distributed the posters to their designated agents affected by the regulations. This year's poster is 12 by 20½ inches in

size. It is printed in chrome yellow, on medium weight bristol board. Above a map illustrating the sections under regulation are summarized the articles under quarantine. At the bottom, reference is made to the source from which may be obtained more detailed quarantine information. Interested plant quarantine officials will be furnished with copies of this poster upon application to the South Norwalk headquarters.

This season's approved wage scale calls for the payment of \$4 per day to scouts, trap inspectors, road inspectors, nursery and greenhouse inspectors, and farm products inspectors. Road patrol captains, trap inspectors in charge, scout foremen, foremen nursery and greenhouse inspectors, and foremen farm products inspectors will be paid \$4.56 per day.

Through arrangements made by Dr. T. B. Symons, Director of the University of Maryland Extension Service, desk room for a Japanese beetle inspector has been provided in the Court House office of the County Agent of Washington County at Hagerstown, Md. Telephone connection is available (Hagerstown 6). The inspector located in Hagerstown has immediate contact with all nurserymen and other dealers in the isolated regulated sections in Washington and Frederick Counties, Md.

As a measure of economy a few large nursery firms located in unquarantined area ship a large number of individual orders in carload lots to central points in the regulated area. At these points the consignment is split and the individual orders mailed or expressed to destination. A portion of such reconsignments return to unregulated sections. Accordingly, certification without inspection is granted for such reshipments.

Freight agents of the New York Central and West Shore Railroads received their notification of the existence of the revised Japanese beetle quarantine regulations through a recently distributed Joint Circular No. 158, issued by the chief of tariff bureau of the common carriers on April 7, 1932. This joint circular reprints verbatim the Federal notice of the quarantine, with revised regulations effective January 1, 1932.

The expected perennial crop of news squibs is appearing in newspapers of the Philadelphia area announcing the first emergence of Japanese beetles in the open ground. Without exception investigation has shown the specimens found, usually a single find magnified to a quantity of beetles, to have emerged from house plants which were last summer subject to beetle infestation.

Outdoor chemical treatments of nursery stock began in New Jersey on April 8 with the carbon disulphide treatment of six evergreens. Similar treatment of a large quantity of evergreens to be moved from a number of Pennsylvania nursery establishments to unregulated territory began on April 21.

Through a cooperative arrangement with the Pennsylvania Department of Agriculture, office space has been supplied in the Oakmont office for Messrs. Fisher and Slesman. These State employees moved their headquarters from Wil-low Grove to Oakmont on April 1.

For the first five months of the year, employees of the Philadelphia

division have contributed a total of \$158.70 to the Unemployment Relief Committee in Philadelphia. This amount is equivalent to one day's pay per month for each contributing employee.

Messrs. Lewis G. Hines, Pennsylvania State Director; A. E. Johnson, Superintendent Transportation Division; and Rush Gramm, Special Agent, of the U. S. Department of Labor, were business visitors at the Oakmont office on April 5.

A soil thermograph has been installed on the grounds adjacent to the Oakmont office by employees engaged in potato wart quarantine work under the auspices of the Pennsylvania Department of Agriculture.

Curricula are being prepared for the annual school for inspectors to be held during the first week in June at the New Jersey district headquarters.

The district offices at Oakmont, Pa., and White Horse, N. J., have both been brightened with coats of paint.

Page St. Patrick: Sixteen young snakes were killed in the rear and around the back door of the Oakmont office early in the month.

On a recent date, several portions of juniper branches were received from Southampton, Long Island, for identification of an injury thereon. There were small white cocoons attached to the foliage and from the injury apparently a leaf miner was present. Some of the material was taken to the Agricultural Experiment Station in New Haven where an attempt will be made to rear and identify the adults. From the literature on hand, it may be possible that this leaf miner is an unidentified species. The arborvitae leaf miner pupates within the foliage whereas in this case, as stated above, the pupa cases or cocoons were found on the outside of the foliage. The damage caused by this miner is in the tunneling out of the inner portions of the foliage, causing it to die and turn brown.

Quarantine line activities in the central area began on April 13 when equipment left the Norwalk Storehouse for New York State. On April 16, two stations were opened at Great Bend, Pa., and Waverly, N. Y. On April 25, five stations--at Roscoe, Fleischmanns, Prattsville, Duaneburg, and Hoffmans, N. Y.--were opened. These seven stations are under the supervision of H. H. Lawrence.

The nursery and greenhouse business has picked up considerably lately, although the nurserymen report that the moving of stock is not yet what it should be.

Preparations were made during the latter part of April to take care of the dealers who will be shipping young plants of aster, chrysanthemum, and dahlia under the European corn borer quarantine after May 1.

## MEXICAN FRUIT WORM

The inspection of fruit gleaned from the trees in the tree-to-tree clean-up and the operation of traps resulted in the taking of specimens of the Mexican fruit fly in 22 groves during April. Infestations had not previously been reported in 19 of these groves. In addition to the infestations found in the groves, one fruit of a shipment from the Valley to San Antonio was found infested. This infestation was found by a storekeeper and reported to the Texas State Department. It was impossible to locate the grove of origin of this fruit. An adult fly was also taken by an inspector at McAllen who observed the fly hovering about a pile of fruit that was being inspected prior to burial. This burial pit was located about two blocks from one of the infested groves at that place, and it is possible that the fly was attracted from this grove by the odor of the fruit juices.

Infestations have been found this season in 59 groves, in the brush on the arroya south of Harlingen, near the burial pit at McAllen, and in a shipment of fruit in San Antonio. These infestations extended from Brownsville to Mission, but were heavier in the upper end of the Valley.

The first known larvae of Anastrepha pallens were taken on the 15th. These larvae were feeding in the fruit of Bumelia angustifolia, a shrub that is common throughout the brush lands of the Valley and known locally by the Mexican name La Coma. It is possible that other native fruits and berries may be hosts of this species of flies, but up to the present we have been unable to find the larvae feeding in other fruits. The Bumelia fruits seem to be rather heavily infested in spots and numerous pupae have developed from collected berries. No explanation is yet available to account for the presence of the adults in the citrus groves. A total of 717 adult A. pallens were taken in the traps during the month in Texas, and 94 adults were taken in Matamoros.

Only one adult Mexican fruit fly was taken in Matamoros during April. The program of four applications of poison bait spray to the trees within an area of four blocks of this infestation was immediately inaugurated. Further inspection during the month of locally produced fruits gave negative results. There is still a considerable quantity of sour oranges, one of the preferred hosts of the fly, on the trees, and the absence of an infestation in this fruit speaks highly of the efficiency of the trapping and baiting operations.

The Mexican officials are again allowing mangoes to be imported to the market and as usual they are heavily infested with larvae of the fruit fly. These fruits are inspected by the Mexican inspector at the Express office and all suspicious fruits confiscated and after inspection destroyed. The inspection of these fruits and fruits from the market resulted in taking 798 larvae and pupae during the month.

The tree-to-tree inspection, which is an annual occurrence at the close of the harvesting period, was completed around the 20th of the month. The purpose of the host-free period is to establish a starvation period in which there is no fruit available to the fly for oviposition or for larval develop-

ment. In order to complete this work as rapidly as possible, laborers are employed to inspect each bearing tree in the Valley and glean any fruit that may have been overlooked by the owner. These laborers work in crews of four to eight under the direct supervision of the inspectors. Where only an occasional fruit is found, it is pulled, inspected, and destroyed. Where it is evident that the owner has not made an honest effort to clean the trees, the crew is pulled out of the grove and the owner instructed to reclean it. Considering the large crop of fruit produced the past season, the low prices received, and the general straitened financial condition of the growers, the thoroughness of the cleanup was considered remarkable. In only a very few cases was it necessary to have the owners reclean a grove. The greatest trouble arose in getting groves of absentee owners cleaned. Cameron County cleaned several of these absentee-owned groves with convict labor.

While making the tree-to-tree inspection a close watch was maintained for alternate host-fruit trees. As a result 258 guava and peach trees were destroyed on 92 premises. Most of these were seedlings that had come up during the past year. Most of the guavas came from roots of plants which had been previously destroyed. To completely eradicate guava plants it is necessary to remove all roots of one-half inch in diameter or larger. Since these plants have a considerable root spread, it is necessary to regrub several times before the plant is completely eradicated.

The sterilization of Valley fruit was completed during the latter part of the month. The fruit came through this process in excellent shape and was readily accepted in the markets. By the time this fruit was released the markets had been fairly well cleaned of fruit and the sterilized fruit brought a considerably higher price than was being paid at the close of the season. Those who were fortunate enough to have fruit in sterilization were highly pleased with the condition of the fruit and with the price received.

On the early morning of the 8th a truck from San Antonio stopped at the Falfurrias Station for inspection. Presumably this truck carried a load of cabbage, but upon close inspection the inspector found about 75 bushels of loose unsterilized fruit under the cabbage. Upon being arraigned in the Justice of the Peace Court at Falfurrias, the trucker pleaded guilty. In view of the deliberate attempt to smuggle this fruit and upon recommendation of the State, the Court imposed a fine of \$50 and costs amounting to \$11. The trucker stated that he had timed his arrival at the station for 2 a. m., when he thought the inspection would be slack. He also said that he had heard of the fines assessed in Starr County and expected if he was apprehended that his fine would be the same (\$10 and costs), but that he appreciated not being given the maximum fine of \$100 as provided in the State law.

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#### PINK BOLLWORM

Mention was made in the last monthly News Letter of the stub cotton problem in the Salt River Valley of Arizona. Arrangements were completed for the removal of this cotton in the two localities found to be infested last

year. It was decided to wait as late as possible so that all of the stubs could be removed with one cleaning. Due to the unusually cool weather during March and April, the stub cotton had not developed sufficiently to begin the clean-up. The latter part of April the first squares were beginning to be noticeable on stub cotton. However, it will be some two or three weeks before these are large enough to become infested with the pink bollworm. It now appears that the clean-up will not get under way before the middle of May.

The cool weather has also interfered considerably with the germination and growth of planted cotton. Some of the farmers became impatient and replanted, but later it was found that seeds from the first planting were beginning to germinate. In some of the districts, however, a small amount of replanting has been necessary. There will be some reduction in cotton acreage in a number of the districts, but as planting is not quite completed it is impossible to determine the exact amount at this time. Water in the Rio Grande, near Presidio, in the Big Bend district of Texas, has been rather low for some time. This river furnishes water for irrigation, and if the supply does not increase in the near future it is possible that some of the acreage will have to be abandoned, even though it has already been planted.

Ginning of the 1931 cotton crop in the regulated areas was finally completed early in April. This season 264,651 bales were ginned, which is considerably less than during the 1930 crop season. However, it should be remembered that several counties which were in the regulated areas at the beginning of the 1931 season were released in November of that year, but after a considerable amount of cotton had been ginned. Comparing the area regulated this year with the same area during 1930, the production decreased about 11 per cent. This season approximately 119,089 tons of cottonseed were sterilized at an average efficiency of about 98 per cent. Over 90 per cent of this seed was shipped to designated oil mills for crushing. Due to the economic conditions all of the seed was not crushed. A considerable supply is being carried over to next season, with the hope of obtaining better prices for oil mill products. All of the oil mills have now closed for the season. The gins and oil mills in the regulated areas have all been thoroughly cleaned.

At the four road stations operating 9,861 cars were inspected during April, from which 63 interceptions were made. Of these interceptions 4 originated in a heavily infested area, 1 of which was found to be infested with the pink bollworm. This interception was a pillow containing about 5 pounds of seed cotton, and was taken at the Van Horn station on April 23. An inspection of the seed resulted in the finding of two dead pink bollworms.

The inspection of green bolls at the San Antonio laboratory continues to give negative results. During April bolls which had previously been collected in 29 counties in Florida and Georgia were examined. Over half a million bolls had been examined at the close of April, these bolls originating in the States of Arkansas, Florida, Georgia, Louisiana, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. At the El Paso laboratory 495 1-pound samples of unsterilized seed were inspected during April, from which 16 specimens of the pink bollworm were taken. These samples had previously been collected in Dona

Ana County, N. Mex., and El Paso and Hudspeth Counties, Tex. The specimens were found in samples from Dona Ana and El Paso Counties. A total of 1,052 pounds of seed has been inspected to date, from which 138 pink bollworms were taken. The majority of these specimens originated in the southern part of Hudspeth County, Tex., which is very heavily infested.

Excellent progress was made on the *Thurberia* plant and weevil survey in southeastern Arizona during April. Several small isolated plant colonies not hitherto reported were found. However, these were more or less in the general vicinity of larger colonies which had previously been reported. A colony of plants in the Tortillita Mountains, north of Tucson, was found to be infested with the *Thurberia* weevil. This colony was reported as infested in 1924. It was again inspected in 1927, but with negative results, no further inspections having been made until this season. It is interesting to note that the area in which this colony is located has been heavily pastured with goats for several years, which made it rather difficult to locate. Most of the plants had been grazed almost to the ground, and very few bolls were available.

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#### PREVENTING SPREAD OF MOTHS

The intensive survey of the northern half of Bridgewater and the southern half of Hillsboro Townships, N. J., was completed during April. A total of 7,042 acres of woodland was scouted and no gipsy moth infestation was found. It is reasonably safe to assume and gratifying to state that the gipsy moth extermination work, inaugurated in July, 1920, has been apparently successful. A small amount of checking work should be done for a few years in the localities likely to be infested in order to detect any possible gipsy moth infestation that might develop.

During 1911, while James B. Duke, who amassed a fortune in tobacco, was developing his residential estate of approximately 2,000 acres on the outskirts of Somerville, N. J., more than 30 acres were planted there with Koster blue spruce trees. These trees were imported from the Netherlands at a time when there were no regulations requiring the inspection of imported nursery stock. This condition, together with the fact that the gipsy moth egg clusters found on the spruce trees in the Duke Estate and those found subsequently from year to year were much darker in color than the egg clusters in New England, was sufficient evidence for the opinion that the gipsy moth in New Jersey was introduced directly from Europe.

In July, 1920, this project sent trained men to New Jersey upon receiving information from the State authorities that there were several acres of trees completely defoliated by the gipsy moth in the 30-acre stand of blue spruce trees in the Duke Estate at Somerville.

The preliminary survey made during July and August determined that there were 100 square miles infested, centering around Somerville. On this

basis, a program of extermination work rather than control was determined upon by the United States Department of Agriculture in cooperation with the State of New Jersey. Appropriations were made in conformity with this estimation of infested territory. A more extensive survey that followed, however, revealed the fact that the seriousness of the problem was much greater because it was found that the insect had spread over an area of approximately 400 square miles. There were 855 scattering colony sites, totaling over 3,000,000 egg clusters, found and treated with creosote during the first year's work. In addition to this, over 500 lots of nursery stock were shipped from the Duke Estate without inspection to 72 points in New Jersey and to 108 towns in 17 other States. These shipments were traced and resulted in finding small gipsy moth infestations in Pennsylvania and New York, as well as isolated colonies in Glen Rock, Wyckoff, Paterson, Madison, Elizabeth, South Orange, and Deal Beach, N. J. Eradication measures were successfully applied at these sites and the colonies were exterminated.

Over the infested area of 400 square miles, intensive control measures were applied such as creosoting egg clusters, burning of dead trees and brush, spraying the foliage with arsenate of lead, banding trees with 8-inch burlap bands, and the application of sticky tree banding material to prevent the caterpillars ascending the trees, thus lessening the danger of wind dispersion, reducing the number of egg clusters that would be found high in the trees; and killing some of the larvae by starvation. The burlap bands provide shelter for the caterpillars during the heat of the day, and by periodical examination of these bands, the larvae which are beneath the burlap are easily crushed with wire brushes.

There was a decided decrease in the infestation found during the second year's work, and each successive year showed further reduction of the infestation based on the number of infested sites found rather than on the quantity of egg clusters treated. The reduced number of infested sites proved that there was little or no spread after extermination work was started.

By 1925, the infestation had been reduced sufficiently to warrant a modification in the plan of work. Intensive work previously carried on yearly in the worst infested part of the area was greatly curtailed. This modification of the plan included scouting work in a belt of townships, approximately 10 miles wide and totaling over 1,400 square miles, which surrounded the extreme limits of the known infested area, to determine if there were any outlying colonies existing beyond the previously established borders of infested territory. Scouting started in January, 1925, and as the work progressed in this belt of townships, it was possible to gradually close in yearly on the center of the infested territory. The plan also afforded a better opportunity of finding colonies in the 400 square mile area because of the likelihood that the insect, if present, would have increased in sufficient numbers to make detection and consequent eradication more positive. As the zone of operations closed in, it was found that the scouting and extermination work could be carried on effectively with reduced expenditures. This additional outside border area, added to the area scouted in years previous to 1925, totaled over 2,300 square miles or nearly six times greater than the 400 square mile area originally infested. This fact should not be overlooked in considering the successful accomplishment.

of freeing New Jersey from the insect nor should sight be lost of the fact that nearly every year, with the exception of the last few years, it was necessary to carry on intensive scouting and extermination work in an area much larger than the original infested area of 400 square miles.

The last live gipsy moth infested site was found in a vacant lot in Piscataway Township that was used as a neighborhood dumping grounds. The tree growth there was low and scrubby. The egg clusters had hatched when this infestation was found in May, 1929, as a result of checking work done around infested sites of previous years. Intensive extermination measures were effectively applied in and around this area. Later checking failed to reveal any gipsy moths in that vicinity.

Assembling cages, charged with material to attract gipsy moth male adults, were placed yearly throughout New Jersey to further determine the presence of this insect in townships outside of the known infested area. With the extensive curtailment of the work, it is intended that similar cages will be placed throughout the State with reference to the areas where work has been carried on in past years.

During the time that gipsy moth work was conducted in New Jersey from 1920 to date, the movement of nursery stock and other materials that were apt to carry infestations, was regulated by a State quarantine. This was enforced by this project acting under State authority and in cooperation with State employees.

The field operations in New Jersey involved an area of 2,300 square miles. This work represented the largest-scale project to eradicate the gipsy moth in a separate large infested area that was ever successfully attempted. Although beset by many perplexing problems, this remarkable accomplishment was made possible by adequate financial aid from the State of New Jersey and the Federal Government, by the hearty cooperation of the State officials and property owners, and the conscientious efforts of the personnel associated with the execution of the field work details.

During April, four weather stations containing equipment for recording temperature and wind direction and velocity were placed in the field and made ready for operation. Annual records obtained from these stations are helpful in connection with investigations pertaining to possible wind drift of gipsy moth caterpillars into the barrier zone.

During the Spring of 1910, preliminary experiments were conducted, and later amplified, which demonstrated that small gipsy moth caterpillars are carried by the wind. Briefly, the results of this early work proved that small gipsy moth caterpillars are transported locally by the wind when its velocity is two or more miles per hour if the temperature is 50° F. or higher, and that newly hatched first instar caterpillars may be carried much greater distances when the wind velocity registers five miles per hour or more with the temperature 65° or higher. Records were obtained indicating a carriage of newly hatched first instar caterpillars approximately 20 miles when the latter weather conditions prevailed. Field study showed that such long-distance spread

occurred from large woodland infestations and that overcrowding, unfavorable food, scarcity of food, and high temperature, stimulated caterpillar activity, increasing the danger of wind dispersion. These studies indicated that long-distance spread was not likely to occur except from heavily infested areas, and only from such locations when the temperature and wind conditions were favorable.

In cooperation with the New York Conservation Department, weather stations as mentioned above have been operated from the last of April until the first of June at Shelburne and Westfield, Mass., and at Berlin and Milan, N.Y., since 1928. In addition to the operation of these four stations, records are obtained from 10 other stations located in the New England States and in New York. Information is secured from numerous locations in the field as to when gipsy moth egg clusters hatched to be used in conjunction with the weather station records. Between the last part of April and early June, gipsy moth egg clusters usually hatch in New England. The first hatch this year was observed on May 2 at Melrose and Burlington, Mass., and Vernon, Vt. Since then hatching has been noticed in several other localities.

When the data in regard to wind spread, based on the weather records taken at various stations, are interpreted on the basis of showing the general trend or the probability of infestation being blown into the zone in any particular year, the information is helpful. A study of tabulations and charts which have been prepared reveals in a striking manner that the wind during most of the dispersion hours is blowing away from the barrier zone; that is, from the south, southwest, and west. This condition is true almost without exception at each of the stations considered separately for 1931 or when taken collectively since the year 1928. The records show in general that climatological conditions during the wind dispersion period are very helpful in preventing long distance westerly and southerly spread of the first instar gipsy moth larvae. However, a detailed study of the charts show ample favorable wind to account for some dispersion into the barrier zone from the east, northeast, and southeast, and danger of such dispersion into the zone will increase rapidly if gipsy moth infestations build up just east of the zone. The records also show that should heavy gipsy moth infestation occur within the zone there would be serious danger of wind dispersion to the west and southwest.

Annually there is a large amount of preliminary work done that is directly associated with high-pressure spraying that might escape the attention of those unfamiliar with this phase of control work. This work is in progress throughout the year to some extent but increases with the approach of the spraying season in June. In Massachusetts and Vermont when an infestation is found, permission is secured from either the tenant, property owner, or some other authorized agent before any control measures are applied. Permission is secured in writing on forms of this project in triplicate, one copy being retained by the signer of the permit. This form reads as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE  
Plant Quarantine and Control Administration

PERMIT FOR CONTROL WORK

In consideration of treating infestations of the \_\_\_\_\_  
by applying spraying and other control measures, I hereby grant per-  
mission to the Plant Quarantine and Control Administration of the  
United States Department of Agriculture, or its authorized agents, to  
enter upon the land herein described:

DESCRIPTION OF PROPERTY

(Give location of street, town, township, county, and State, and  
area of land or other necessary information to properly identify)

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It is mutually understood and agreed that I shall not be liable  
for any of the expense of this work or for any improvements to the  
property resulting therefrom, nor shall I hold the United States of  
America, or its agents, responsible for any damages whatsoever result-  
ing from the above, or acts done in pursuance of authority herein granted.

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Date \_\_\_\_\_

(Signature) \_\_\_\_\_

\_\_\_\_\_  
(Name of employee who secured permit) (Indicate whether owner, lessee, tenant)

THIS PERMIT EXPIRES AUGUST 1, 19\_\_

It will be noted that ample provision is allowed for the description  
and location of the property on which the work is to be done. Also provision  
is made for any conditions surrounding the issuance of the permit. These con-  
ditions vary, but usually involve the question of whether or not an adhesive  
is to be used in the spray solution, whether certain trees or small pasture  
areas within the area to be treated are to be left unsprayed, or whether barb-  
ed wire fences are to be erected to prevent livestock from grazing in the  
sprayed area.

It is often very difficult to secure these permits, the chief reason  
being the inability to contact with the person authorized to sign the permit  
and the necessity for dealing with owners or tenants who do not understand or  
speak the English language well enough to converse with the employee.

After estimating the quantities of the various materials that are needed  
in spraying the infestations, convenient temporary storage facilities must be  
arranged for to receive these supplies in advance of the spraying season.

The locations for sprayer truck set-ups with regard to the availability  
and accessibility of water is determined. Occasionally portions of back roads

must be repaired and bridges strengthened to allow a sprayer truck, which weighs approximately 7 to 8 tons when loaded, to pass without being mired en route to the set-up location.

Scouting work as planned was completed in Dorset, Vt., during April. There were 15,870 acres examined with negative results. Four crews were scouting woodland in Danby and Pawlet, Vt., during April without finding any gipsy moth infestations. There were 70 agents returned to the barrier zone area in Massachusetts and Connecticut from New Jersey when the scouting work in the latter place was completed on April 16. This made it possible to put 11 crews in Massachusetts and 7 crews in Connecticut in addition to the 4 crews in Vermont. In Massachusetts, intensive work was carried on in Lee, New Marlboro, Sandisfield, Sheffield, Stockbridge, and Tyringham. Up to and including April 30, there was a total of 41 infested sites found in Massachusetts consisting of 335 new gipsy moth egg clusters--23 sites in New Marlboro, 3 in Sandisfield, 14 in Sheffield, and 1 in Tyringham. In Connecticut, intensive scouting work was conducted in Canaan, Cornwall, Norfolk, Salisbury, and Warren. Similar work was concluded as planned in Washington with negative results on April 2. At the close of the month, there were 14 infested sites, aggregating 170 new egg clusters, found and treated with creosote--4 sites in Canaan, 1 in Norfolk, 2 in Salisbury, and 7 in Warren. Work was completed on April 30 at Norfolk and Salisbury and the men were transferred to Canaan.

The New York Conservation Department advises that there were six scouting crews engaged in the examination of woodlands on April 30 in the following barrier zone towns in New York: New Lebanon, in Columbia County, and North Salem and Mt. Pleasant, in Westchester County. The general reduction in their scouting force was made in April due to the exhaustion of funds.

In addition to these 6 crews, there are 4 scouting crews at work on Long Island--3 in Islip and 1 in the Borough of Queens.

Inspection continued around isolated colony sites found in previous years in Southold, Southampton, Easthampton, and Brookhaven, Suffolk County, L. I., and also in Rhinebeck and Milan, Dutchess County, in the barrier zone. No additional infestations were found by the New York State crews during April on Long Island or in that portion of the barrier zone scouted by them.

During April there were 258 shipments of nursery stock and other quarantined products examined and certified for shipment in New Jersey. There were no gipsy moths found on these shipments.

On Long Island, there were 347 shipments of nursery stock offered for inspection which originated in Nassau County. There were no gipsy moths found on these shipments.

It was not until the middle of April that nursery stock was shipped abundantly throughout the quarantined area. Unseasonal weather retarded favorable digging conditions, and as a result the nurseries were about two weeks late this year in their spring operations. The cold weather did not affect the shipping of stored nursery stock. Toward the end of April the shipping season

had reached its peak. At this time 24 agents were transferred temporarily from the scouting force to assist in handling the increase in the inspection service. These agents were distributed throughout the quarantined area, and they work under the supervision of the district inspector. In lining up their spring business, most nurseries follow the same procedure with regard to filling of orders. Their wholesale trade, which is carload lot shipments to smaller nurseries, and truck shipments consisting principally of rose bushes and small shrubs, to department stores, are given priority. When this class of trade is taken care of, attention is given to retail trade. This usually comprises small orders from individuals living outside of the area quarantined. As the season progresses, there is a brisk trade to landscape gardeners, who truck to points immediately outside of the regulated area.

With the advent of the warm, mild, spring weather, there is an increase in travel by automobile and owners of property often visit nurseries for the purpose of picking out trees or shrubs which they desire to have growing on their home grounds. In nearly all cases the customers are insistent on taking their purchases with them. This type of trade creates special inspection problems, for immediate inspection at the time of purchase is the only kind that will satisfy both the nursery owner and the purchaser. For the larger nurseries, at which inspectors are present all of the time, the problem is a simple one, but at the smaller nurseries, whose volume of shipping is not sufficient to warrant an inspector being on hand all of the time, it is not so easy to deal with. In addition to the nurseries that sell to visiting customers, there are also some roadside stands at which small lots of nursery stock are displayed for sale.

From the quarantine standpoint, the stock sold at roadside stands can be divided into two classes: Stock which originates within the quarantined area and requires inspection and certification for transportation outside of that area, and stock which originates outside of the area, for whose transportation only permits are necessary. All stands selling stock are closely supervised by the inspectors in whose districts they are located. Stock from inside of the quarantined area is inspected immediately on its arrival at the stand and a record made of the amount. The owner of the stand is then issued a definite number of certificates to be used by him only on sales which are to be transported outside of the area. He is required to make a record of all such sales, with the destination of each, and keep an accurate record of the certificates used. His records of certificates are checked regularly as is also his stock on hand. He is required to notify the district inspector immediately when he purchases new stock, and none of this may be displayed for sale until inspection has been made.

In some cases the stock sold is obtained from outside of the quarantine area and for such stock, after satisfactory evidence of origin is presented to the inspector, permits are issued to the owner. Records of these must be kept the same as for certificates, and new lots purchased must be reported to the inspector for his approval before being placed on sale.

The handling of transient sales at nurseries, termed "Cash and Carry Sales" by the nurserymen, presents somewhat more of a problem, as customers oftentimes desire to look at almost all of the stock in the nurseries before picking out that which may be desired. The nursery owner who plans to make suc



sales may operate under much the same plan as the owner of the roadside stand, but because his stock will come from his nursery and this can not be inspected before digging, there are other requirements with which he must comply. In the first place he must set aside a definite plot of ground not contiguous with his nursery proper, and all cash and carry sales must be made from this controlled area. Stock removed from his nursery to this display plot must all be inspected after digging before it is placed there. He is then at liberty to heel-in the stock or place it there with the roots encased in burlap ready for shipment. The district inspector after inspection is complete issues the proper certificates for transportation, after having made note of the amount and kind of stock placed in the display plot. The owner is required to keep records of the sales for which certificates were needed and must account for all of the certificates. No new stock may be placed in the display plot until after it is inspected, and periodic visits are made to check the stock and records. Any failure to comply with the requirements causes the immediate canceling of the arrangement and the return to the inspector of all the unused certificates.

Each year a large nursery located in Rochester, N. Y., which is outside of the regulated gipsy moth area, ships carloads of nursery stock to central points within the area. These carload shipments consist of many small orders and are consigned to distributing agents for reshipment to their destination. This practice enables the nursery to profit by carload lot shipping rates, which are considerably less than the price of sending the individual orders from Rochester, N. Y., to the ultimate destinations. In April, two carloads of such orders of nursery stock were received at Greenfield, Mass., one at White River Junction, Vt., one at Bangor, Me., and one at Milford, N. H. This material does not require inspection, because it originated outside of the gipsy moth quarantined area, but it is necessary to issue a permit to cover the movement of the material after it arrives in the quarantined area in the event it is reshipped to points outside.

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